PROJECT NUMBER: 1708
PROJECT TITLE: Physical Chemistry and Process Monitoring
PROJECT LEADER: J. L. Banyasz
PERIOD COVERED: November 1988

I. OPERATIONS SUPPORT (P. Henderson, in collaboration with the Applied Technology Group)

A. Objective: Characterization of inks.

B. Results: Dr. Julius Silver of the Rochester Institute of Technology presented a three-day seminar on printing technology at 20th Street. Dr. Silver has been retained as a consultant.

The capabilities of the ink laboratory have now been considerably extended with the arrival of the printability tester, the rub dryness tester, and the Hunter Labscan colorimeter, in addition to the inkometer and Brookfield viscometer. The ink characterization program has been broadened to include B&H ocher, B&H green, Marlboro black, and L&M maroon in combination with six current production papers. The tests now include setting time, drying time, color coordinates, tack, and viscosity.

C. Plans: The construction of a simulator to simulate the printing process on the maker is planned.

II. OPERATIONS SUPPORT (J. Crump and A. Closter, in collaboration with the Applied Technology Group)

A. Objective: Determine the effect of particle size distribution on dynamic viscosity changes that occur in PVA tipping adhesives.

B. Results: The roller speed study was continued. with the testing of four more adhesives. Of all the materials tested, the best performance was obtained from Ajax adhesive 563-6, currently in use at Louisville. This formulation remained within specifications with regard to viscosity at all times during forty minute idles at various roller speeds. The Fuller "Full Run" adhesive differed from all other materials tested in that it exhibited thixotropic behavior.

C. Plans: Plans have been made to modify the simulator so as to allow it to simulate the Mark 10A maker.

III. MENTHOL STUDIES (D. Driscoll and T. Van Auken)

A. Objective: Determine the diffusion coefficient of menthol in cellulose acetate (CA).

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B. **Results**: The permeability of menthol through CA (unplasticized) film has been determined at 70°C. Only steady state permeability was observed. The experiment will be repeated to ensure no leaks were present. The approach will also be modified so as to allow starting the measurements after a shorter initial time interval in hopes of observing the transient region, which would allow calculation of the diffusion coefficient.

C **Plans**: This work is ongoing.

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